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11TLE 0.5mm	0.5mm Pitch FPC/FFC Connector SFVR-1/2STE_ HLF		REVISION
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		CLASSIFICATION UNRESTR	ICTED

1. SCOPE

This specification covers the requirements for the connector (SFV__R-1/2ST_E_HLF) with 0.5mm spacing to which the edge of FPC(Flexible Printed Circuit) and FFC(Flexible Flat Cable) can be connected by Zero-Insertion-Force method and which copes with automatic mounting and SMT.

2. APPLICABLE STANDARDS

JIS C 5402Method for Test of Connectors for Electronic EquipmentJIS C 0806Packing of Electronic Components on Continuous Tapes
(Surface Mount Components)UL - 94TESTS FOR FLAMMABILITY OF PLASTIC MATERIALS FOR PARTS IN
DEVICES AND APPLIANCES.

3. CATALOG No. STRUCTURE

	SFV	20	R –	1	ST E	1 HLF
Series			T	T		\top $\overline{\top}$
Number of Contacts						
Right Angle						
For FPC/FFC, Contact direction			······			
1 : Lower contact type						
2 : Upper contact type						
Cope with automatic mounting & SMT -						
Plating Variation						
Blank & Z : Thin Tin plating						
Plastic Tape Packaging						
Halogen and Lead Free		·····				

- 4. CONNECTOR SHAPE, DIMENSIONS AND MATERIALS See attached drawings.
- 5. ACCOMMODATED CONDUCTORS (FPC/FFC) See attached drawings.
- 6. PACKAGING CONDITION See attached drawings.
- 7. RECOMMENDED MOUNTING PATTERN DIMENSIONS See attached drawings.

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8. RATING

8-1. Voltage : A.C.50V D.C.50V

8-2. Current : A.C.0.5A D.C.0.5A (Refer to the following note.)

8-3. Operating Temperature : -55°C ~ +105°C (Including terminal temperature rises) NOTE

Allowable maximum current for one contact is 0.5A. Total allowable current for a whole connector is the value which is shown in the following figure.



Number of contacts

9. PERFORMANCE CHARACTERISTICS

9-1. Electrical Performance

No.	Test Item	Test Method	Requirements
9-1-1	Contact resistance	 Measure contact resistance between V₁-V₂ by voltage drop method by the following circuit by mating accommodated conductor specified in clause 5 after reflow soldering the connector on the P.CB. Soldering Connector Pattern V1 V2 Pattern Conductor P.C.B A Open circuit voltage : Less than A.C.20mV Test current : Less than A.C.20mA 	 Initial value Less than 30m Ω Contact resistance after the test is in accordance with the value specified in each test item.

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9-1-2	Insulation resistance	 Measure insulation resistance between adjacent contacts in a connector individual. Test voltage : D.C.500V Read value one minute after applying test voltage. 	1) More than 100MΩ
9-1-3	Dielectric withstanding voltage	 For one minute, apply A.C.200V between adjacent contacts in a connector individual. Set current : A.C.1mA 	1) Free from any short circuit and insulation breakdown.

9-2. Mechanical Performance

No.	Test Item	Test Method	Requirements
9-2-1	Durability (Slider operation)	 Measure contact resistance before and after the test by the method in clause 9-1-1 by mating the accommodated conductor specified in clause 5. Number of slider open and close : 20 times (Insert and extract the conductor for each opening of the slider.) 	 Initial contact resistance : Less than 30m Ω Contact resistance after the test : Less than 50m Ω Free from any defect such as break etc. on the connector and conductor.
9-2-2	Vibration (Sinusoidal)	JIS C 60068-2-6 (IEC60068-2-6) 1)Frequency range : 10 ~ 500Hz 2)Amplitude : 0.75mm or Acceleration : 100m/s ² 3)Sweep rate : 1 octave/minute 4)Kind of test : Sweep endurance test 5)Test time : 10 cycles	 During the test, no circuit opening for more than 1 μ s. Free from any defect such as break, deformation, loosing and falling off etc. on each portion of the connector.

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9-3. Environmental Performance

No.	Test Item	Test Method	Requirements
9-3-1	Damp heat (Steady state)	 JIS C 60068-2-78 (IEC60068-2-78) 1) Measure contact resistance before and after the test by the method in clause 9-1-1 by using the accommodated conductor specified in clause 5. 2) Measure insulation resistance after the test by the method in clause 9-1-2. 3) Bath temperature : 40°C 4) Bath humidity : 90 ~ 95%(relative humidity) 5) Period of exposure : 48 hours 6) Expose conductor and connector in mated condition and leave them under normal temperature.(Without insertion and separation) 	 Initial contact resistance Less than 30m Ω Contact resistance after the test : Less than 50m Ω Insulation resistance after the test : More than 100M Ω
9-3-2	Salt spray	 JIS C 60068-2-11 (IEC60068-2-11) 1) Measure contact resistance before and after the test according to the method in clause 9-1-1 by using accommodated conductor specified in clause 5. 2) Salt solution concentration : 5% 3) Period of exposure : 48 hours 4) Expose conductor and connector in mated condition and leave them under normal temperature after posttreatment. (24 hours) 	 1) Initial contact resistance Less than 30m Ω 2) Contact resistance after the test : Less than 50m Ω

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9-3-3	Change of temperature	 JIS C 0025 (IEC60068-2-14) 1) Measure contact resistance before and after the test according to the method in clause 9-1-1 by using accommodated conductor specified in clause 5. 2) One cycle of temperature is as follow and 			istance before the method in modated con	 1) Initial contact resistance Less than 30m Ω 2) Contact resistance after the test : Less than 50m Ω 3) Free from any defect such 	
			t 5 cyc Step	cles. Temp.(°C)	Time(min.)]	as crack, warping and deformation etc. on each
			1	-55±3	30		portion the connector.
			2	25±2	2~3	1	
			3	85±2	30]	
			4	25±2	2~3]	
		con	-	n and leave th	nd connector i hem under no		

9-4. Other performance

		Requirements
Soldering (Resistance to reflow soldering)	 JIS C 60068-2-58 (IEC60068-2-58) 1) Solder by setting reflow bath on the following condition. 2) Preheating: 150~180°C, 120±5 s 3) Soldering: 220°C min. 60s max. 4) Peak: 245°C min. 20s max. (Peak 255°C max.) NOTE: Temperature must be measured at contact terminal portion and peak temperature on the upper surface of P.C.B must be less than 260°C. 5) Solder paste to be used is JIS Z 3282 Sn96.5Ag3.0Cu0.5 	 Contact resistance after the test : Less than 50m Ω Insulation resistance after the test : More than 100M Ω No short circuit and insulation breakdown for dielectric withstanding voltage test after this test. Free from any damage on performance and contact performance after soldering.
	Diagram A °C 245 245 245 205 m 205 m 205 m 205 m 205 m 205 m	ax. TIME
	(Resistance to reflow	Soldering (Resistance to reflow soldering)1) Solder by setting reflow bath on the following condition.1) Solder by setting reflow bath on the following condition.2) Preheating: 150~180°C, 120±5 s 3) Soldering :220°C min. 60s max. (Peak 255°C max.)4) Peak : 245°C min. 20s max. (Peak 255°C max.)(Peak 255°C max.) NOTE: Temperature must be measured at contact terminal portion and peak temperature on the upper surface of P.C.B must be less than 260°C.5) Solder paste to be used is JIS Z 3282 Sn96.5Ag3.0Cu0.5SolderingDiagram A°CPeakPeak

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	Soldering (Solderability) (Reflow)	 JIS C 60068-2-58 (IEC60068-2-58) 1) Solder by setting reflow bath on the following condition. 2) Preheating: 150~180°C, 60~120s 3) Soldering: 225°C min., 20±5s (Peak 235°C max.) NOTE: Temperature must be measured at contact terminal portion and peak temperature on the upper surface of P.C.B must be less than 260°C. 4) Solder paste to be used is JIS Z 3282 	1) Actual soldered area must be more than 90% of the dipped area intended to be soldered.
9-4-2		Sn96.5Ag3.0Cu0.5 Diagram B 225 225 225 180 42150 60~120s Solderability pro-	TIME
9-4-3	Conductor retention force (Reference)	 Measure initial retention force after inserted and locked by using accommodated conductor specified in clause 5. *FCI Test FPC : t=0.33mm Tin plating 	 More than 0.59N/contact for FPC (More than 60gf/contact for FPC) More than 0.39N/contact for FFC (More than 40gf/contact for FFC)

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10. INDICATION AND PACKAGING

- 10-1. Indication
 - 1) Catalog number and lot number are not be indicated on the connector.
 - 2) Catalog number and quantity shall be indicated on the surface of the package box.

10-2. Packaging

 The connector individuals are packed by tapes with specified quantity in accordance with [JIS C 0806 "Packaging of Electronic Components on Continuous Tapes (Surface Mount components)"] and put into package box in accordance with FCI JAPAN packaging specification.

11. REMARKS

- 11-1. Please refer to the "Handing procedures and remarks" before use.
- 11-2. Retention force for accommodated conductor specified in clause 9-4-3 differs due to different thickness, structure and surface treatment of conductor. Therefore, the value of retention force specified in the clause for performance is reference value.
- 11-3. Since this connector can not be used for CIC (Conductor such as silver paste, carbon etc.) as accommodated conductor, please consult us separately.

12. RECOMMENDED REFLOW PROFILE



Note: Please check the reflow soldering condition for your own application beforehand due to different conditions with soldering devices, P.C. Boards, etc. No moisture treatment before reflow process.

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13. REVISION RECORD

REV.	PAGE	DESCRIPTION	ECR#	DATE
Α	ALL	RELEASE	J10-0028	2010-2-8
В	4	Operating temperature change from -55°C ~ +85°C to -55°C ~ +105°C	J10-0041	2010-2-19

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